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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

ZARNEKE, DAVID A

ART UNIT	PAPER NUMBER
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2829

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/650,692	Applicant(s) YONEDA ET AL.	
	Examiner David A. Zarneke	Art Unit 2829	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6 and 21-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6 and 21-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 10/100011.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/29/03; 12/1/03; 2-25-04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102(b)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 6 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Jacobs, US Patent 5,055,907.

Jacobs teaches a manufacturing method of a semiconductor device, comprising:
a redistribution board forming step of forming a redistribution board [15] on a base board [10];

a base board separating step of separating the base board from the redistribution board (figure 2E); and

a semiconductor element mounting step of mounting at least one semiconductor element [25a-c] on the redistribution board via electrode pads (7, 36+) formed on a surface of the redistribution board.

With respect to claim 22, while Jacobs fails to explicitly teach a redistribution board mounting step of mounting the redistribution board on a package board via electrode pads formed on an other surface of the redistribution board, connecting the redistribution board of Jacobs to a package board is implicitly taught because the structure of Jacobs has to be used, or applied, in order to be useful. Attachment to a

package board is the typical manner in which the structure of Jacobs would be used by a skilled artisan (MPEP 2144.01).

Claims 6, 22 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Kuramochi, US Patent 5,654,590.

Kuramochi teaches a manufacturing method of a semiconductor device, comprising:

a redistribution board forming step (figures 3-9) of forming a redistribution board [26] on a base board [10];

a base board separating step (figure 11) of separating the base board from the redistribution board; and

a semiconductor element mounting step (figure 12) of mounting at least one semiconductor element [30] on the redistribution board via electrode pads [24] formed on a surface of the redistribution board.

With respect to claim 22, while Kuramochi fails to explicitly teach a redistribution board mounting step of mounting the redistribution board on a package board via electrode pads formed on an other surface of the redistribution board, connecting the redistribution board of Kuramochi to a package board is implicitly taught because the structure of Kuramochi has to be used, or applied, in order to be useful. Attachment to a package board is the typical manner in which the structure of Kuramochi would be used by a skilled artisan (MPEP 2144.01).

Regarding claim 25, Kuramochi teaches the base board is made of silicon (5, 18+); and the base board separating step includes a step of removing the silicon by

using etching (6, 55+).

Claim Rejections - 35 USC § 102(e)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 6, 22, and 25 are rejected under 35 U.S.C. 102(e) as being anticipated
Jacobs, US Patent 6,294,407.

Jacobs teaches a manufacturing method of a semiconductor device, comprising:

a redistribution board forming step (figures 3A-F) of forming a redistribution board
[140] on a base board [210];

a base board separating step of separating the base board from the redistribution
board (figure 5); and

a semiconductor element mounting step of mounting at least one semiconductor
element [102] on the redistribution board via electrode pads formed on a surface of the
redistribution board (figure 6).

With respect to claim 22, Jacobs teaches a redistribution board mounting step of
mounting the redistribution board on a package board [120] via electrode pads formed
on an other surface of the redistribution board (figure 4).

Regarding claim 25, Jacobs teaches the base board is made of silicon; and the base board separating step includes a step of removing the silicon by using etching.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 6, 22, and 25 are rejected under 35 U.S.C. 102(e) as being anticipated Brofman et al., US Patent Application Publication 2002/0180013.

Brofman teaches a manufacturing method of a semiconductor device, comprising:

a redistribution board forming step (figures 2A-I) of forming a redistribution board [8] on a base board [16];

a base board separating step of separating the base board from the redistribution board (figure 2L); and

a semiconductor element mounting step of mounting at least one semiconductor

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element [44] on the redistribution board via electrode pads [13] formed on a surface of the redistribution board (figure 2M).

With respect to claim 22, Brofman teaches a redistribution board mounting step of mounting the redistribution board on a package board [32] via electrode pads [22] formed on an other surface of the redistribution board (figure 2K).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 21, 23, and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs, US Patent 5,055,907, as applied to claim 6.

Regarding claim 21, while Jacobs fails to teach the step of forming the redistribution board includes the step of forming the redistribution board incorporating a passive element on the base board, it would have been obvious to one of ordinary skill in the art to use the passive element in the base board of Jacobs because it is conventionally known to a skilled artisan to include a passive element in the base board.

The use of conventional materials to perform there known functions in a conventional process is obvious. In re Raner 134 USPQ 343 (CCPA 1962).

As to claim 23, while Jacobs, which teaches the use of a glass substrate (5, 26+) fails to teach the base board is made of a silicon wafer, Jacobs does teach a plurality of the redistribution boards are integrally formed on said silicon wafer, and the redistribution boards are individualized after the base board removing step (figure 4 & 9, 55+).

It would have been obvious to one of ordinary skill in the art to use silicon as the base board in the invention of Jacobs because silicon and glass are acceptable equivalent materials useable as base boards.

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16

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USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

Regarding claim 25, Jacobs, which teaches a glass substrate (5, 26+), fails to teach the base board is made of silicon; but Jacobs does teach the base board separating step includes a step of removing the silicon by using etching (8, 12+).

It would have been obvious to one of ordinary skill in the art to use silicon as the base board in the invention of Jacobs because silicon and glass are acceptable equivalent materials useable as base boards.

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

With respect to claim 26, Jacobs teaches the base board separating step includes the step of removing the silicon by using etching only (8, 12+), but fails to teach the use of etching grinding together.

It would have been obvious to one of ordinary skill in the art to use both etching and grinding to remove the silicon base board in the invention of Jacobs because the combination of etching and grinding makes the removal step quicker, easier and safer than using etching alone.

As to claim 27, Jacobs, which teaches the use of glass base board (5, 26+), fails

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to teach the base board is made of copper or copper alloy; but Jacobs does teach the base board separating step includes a step of etching the base board (8, 12+).

It would have been obvious to one of ordinary skill in the art to use copper or a copper alloy as the base board in the invention of Jacobs because or a copper alloy and glass are acceptable equivalent materials useable as base boards.

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs, US Patent 5,055,907, as applied to claim 6 above, and further in view of Jacobs, US Patent 6,294,407.

Jacobs 907 fails to teach the base board is made of a sapphire board including a thin organic film formed on a surface where the redistribution board is formed; and the base board separating step includes a step of irradiating a laser beam to the thin organic film via the sapphire board and vaporizing the thin organic film.

First, it would have been obvious to one of ordinary skill in the art to use sapphire as the base board in the invention of Jacobs because sapphire and glass are acceptable equivalent materials useable as base boards.

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16

USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

Jacobs 407 (figure 5) teaches the use of a thin organic film [212] formed on a surface where the redistribution board [140] is formed; and the base board [210] separating step includes a step of irradiating a laser beam (9, 13+) to the thin organic film via the sapphire board and vaporizing the thin organic film.

It would have been obvious to one of ordinary skill in the art to use the organic film and the laser separation technique of Jacobs 407 in the invention of Jacobs 907 because this technique does not damage the substrates like an etchant would. The laser attacks only the organic film and not the base board or, and more importantly, the redistribution board.

Claims 21, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuramochi, US Patent 5,654,590, as applied to claim 6 above.

Regarding claim 21, Kuramochi fails to teaches the step of forming the redistribution board includes the step of forming the redistribution board incorporating a passive element on the base board.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a passive element on the base board because it is conventionally known to a skilled artisan to include a passive element in the base board.

The use of conventional materials to perform there known functions in a conventional process is obvious. In re Raner 134 USPQ 343 (CCPA 1962).

With respect to claim 26, Kuramochi teaches the base board separating step includes the step of removing the silicon by using etching only (6, 55+), but fails to teach the use of etching and grinding together.

It would have been obvious to one of ordinary skill in the art to use both etching and grinding to remove the silicon base board in the invention of Kuramochi because the combination of etching and grinding makes the removal step quicker, easier and safer than using etching alone.

As to claim 27, Kuramochi, which teaches the use of aluminum base board (5, 26+), fails to teach the base board is made of copper or copper alloy; but Kuramochi does teach the base board separating step includes a step of etching the base board (6, 55+).

It would have been obvious to one of ordinary skill in the art to use copper or a copper alloy as the base board in the invention of Kuramochi because copper or a copper alloy and aluminum are acceptable equivalent materials useable as base boards.

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuramochi, US Patent 5,654,590, as applied to claim 6 above, and further in view of Jacobs, US Patent 5,055,907.

Kuramochi teaches the base board is made of a silicon wafer, but fails to teach a plurality of the redistribution boards are integrally formed on said silicon wafer, and the redistribution boards are individualized after the base board removing step.

Jacobs teaches a plurality of the redistribution boards are integrally formed on said silicon wafer, and the redistribution boards are individualized after the base board removing step (figure 4 & 9, 55+).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the base board wafer of Jacobs in the invention of Kuramochi because Jacobs's method is a quicker, cheaper way to form multiple redistribution boards.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuramochi, US Patent 5,654,590, as applied to claim 6 above, and further in view of Jacobs, US Patent 6,294,407.

Kuramochi fails to teach the base board is made of a sapphire board including a thin organic film formed on a surface where the redistribution board is formed; and the base board separating step includes a step of irradiating a laser beam to the thin organic film via the sapphire board and vaporizing the thin organic film.

First, it would have been obvious to one of ordinary skill in the art to use sapphire as the base board in the invention of Kuramochi because sapphire and glass are acceptable equivalent materials useable as base boards.

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

Jacobs (figure 5) teaches the use of a thin organic film [212] formed on a surface where the redistribution board [140] is formed; and the base board [210] separating step includes a step of irradiating a laser beam (9, 13+) to the thin organic film via the sapphire board and vaporizing the thin organic film.

It would have been obvious to one of ordinary skill in the art to use the organic film and the laser separation technique of Jacobs in the invention of Kuramochi because this technique does not damage the substrates like an etchant would. The laser attacks only the organic film and not the base board or, and more importantly, the redistribution board while the etchant must be closely watched and controlled in order to keep it from etching the redistribution board.

Claims 21, 23, 24, 26, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs, US Patent 6,294,407, as applied to claim 6 above.

Regarding claim 21, while Jacobs fails to teach the step of forming the redistribution board includes the step of forming the redistribution board incorporating a passive element on the base board, it would have been obvious to one of ordinary skill in the art to use the passive element in the base board of Jacobs because it is conventionally known to a skilled artisan to include a passive element in the base board.

The use of conventional materials to perform there known functions in a conventional process is obvious. In re Raner 134 USPQ 343 (CCPA 1962).

As to claim 23, Jacobs teaches the base board is made of a silicon wafer (8, 5+), a plurality of the redistribution boards are integrally formed on said silicon wafer, and the redistribution boards are individualized after the base board removing step (Figure 4).

While Jacobs teaches individualizing prior the base board removing step, it would have been obvious to one of ordinary skill in the art at the time of the invention to individualizing after the base board removing step because it is much quicker, cheaper and requires less tooling to mount the wafer to the package board and then individualize that to individualize and then mount on the package board.

In re claim 24, Jacobs, which teaches glass, silicon or other conventional substrates (8, 6+), fails to teach the base board is made of a sapphire board, but Jacobs does teach including a thin organic film [212] formed on a surface where the redistribution board is formed; and the base board separating step includes a step of irradiating a laser beam to the thin organic film via the sapphire board and vaporizing the thin organic film (9, 13+).

It would have been obvious to one of ordinary skill in the art to use sapphire as the base board in the invention of Jacobs because sapphire is one of the conventional substrates Jacobs was referring to that is useable as a base board.

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin

125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

With respect to claim 26, Jacobs teaches the base board separating step includes the step of removing the silicon by using etching only (8, 12+), but fails to teach the use of etching grinding together.

It would have been obvious to one of ordinary skill in the art to use both etching and grinding to remove the silicon base board in the invention of Jacobs because the combination of etching and grinding makes the removal step quicker, easier and safer than using etching alone.

As to claim 27, Jacobs, which teaches the use of glass base board (5, 26+), fails to teach the base board is made of copper or copper alloy; but Jacobs does teach the base board separating step includes a step of etching the base board (8, 12+).

It would have been obvious to one of ordinary skill in the art to use copper or a copper alloy as the base board in the invention of Jacobs because or a copper alloy and glass are acceptable equivalent materials useable as base boards.

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

Claims 21, 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brofman, et al., US Patent Application Publication 2002/0180013 as applied to

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claim 6 above.

Regarding claim 21, while Brofman fails to teach the step of forming the redistribution board includes the step of forming the redistribution board incorporating a passive element on the base board, it would have been obvious to one of ordinary skill in the art to use the passive element in the base board of Brofman because it is conventionally known to a skilled artisan to include a passive element in the base board.

The use of conventional materials to perform there known functions in a conventional process is obvious. In re Raner 134 USPQ 343 (CCPA 1962).

In re claim 24, Brofman fails to teach the base board is made of a sapphire board, but Brofman does teach including a thin organic film [15] formed on a surface where the redistribution board is formed; and the base board separating step includes a step of irradiating a laser beam to the thin organic film via the sapphire board and vaporizing the thin organic film (5, [0082]).

It would have been obvious to one of ordinary skill in the art to use sapphire as the base board in the invention of Brofman because sapphire is a conventional substrate that a skilled artisan would know is useable as a base board.

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

Regarding claim 25, Brofman, which teaches a glass substrate (3, [0065]), fails to

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teach the base board is made of silicon; but Jacobs does teach the base board separating step includes a step of removing the silicon by using etching (the laser etching @ 5, [0082]).

It would have been obvious to one of ordinary skill in the art to use silicon as the base board in the invention of Jacobs because silicon and glass are acceptable equivalent materials useable as base boards.

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

With respect to claim 26, Brofman teaches the base board separating step includes the step of removing the silicon by using etching only (the laser etching @ 5, [0082]) but fails to teach the use of etching and grinding together.

Regarding the silicon base board, it would have been obvious to one of ordinary skill in the art to use silicon as the base board in the invention of Brofman because silicon and glass are acceptable equivalent materials useable as base boards.

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

With respect to the etching and grinding, it would have been obvious to one of ordinary skill in the art to use both etching and grinding to remove the silicon base board in the invention of Brofman because the combination of etching and grinding makes the removal step quicker, easier and safer than using etching alone.

As to claim 27, Brofman, which teaches the use of glass base board (3, [0065]), fails to teach the base board is made of copper or copper alloy; but Brofman does teach the base board separating step includes a step of etching the base board (the laser etching @ 5, [0082]).

It would have been obvious to one of ordinary skill in the art to use copper or a copper alloy as the base board in the invention of Brofman because copper or a copper alloy and glass are acceptable equivalent materials useable as base boards.

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brofman, et al., US Patent Application Publication 2002/0180013, as applied to claim 6 above, and further in view of Jacobs, US Patent 5,055,907.

Brofman fails to teach the base board is made of a silicon wafer, a plurality of the redistribution boards are integrally formed on said silicon wafer, and the redistribution boards are individualized after the base board removing step.

Jacobs teaches a plurality of the redistribution boards are integrally formed on a silicon wafer (8, 5+), and the redistribution boards are individualized after the base board removing step (figure 4 & 9, 55+).

It would have been obvious to one of ordinary skill in the art to use the silicon base board of Jacobs in the invention of Brofman because silicon and glass are acceptable equivalent materials useable as base boards, as taught by Jacobs (8, 5+).

The substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution (Ex parte Novak 16 USPQ 2d 2041 (BPAI 1989); In re Mostovych 144 USPQ 38 (CCPA 1964); In re Leshin 125 USPQ 416 (CCPA 1960); Graver Tank & Manufacturing Co. V. Linde Air Products Co. 85 USPQ 328 (USSC 1950).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the base board wafer of Jacobs in the invention of Brofman because Jacobs's method is a quicker, cheaper way to form multiple redistribution boards.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A. Zarneke whose telephone number is (571)-272-1937. The examiner can normally be reached on M-F 7:30 AM-6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Baumeister can be reached on (571)-272-1712. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

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